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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/670,124  | 09/26/2000  | Wai-Chung Chan       | PD-200126           | 5665             |
| 7590  | 07/13/2005  |                      | EXAMINER            |                  |
| Hughes Electronics Corporation<br>Patent Docket Administration<br>P O Box 956<br>Bldg 1 Mail Stop A109<br>El Segundo, CA 90245-0956 |             |                      | DUONG, THOMAS       |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2145                |                  |
| DATE MAILED: 07/13/2005   |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|------------------------------|------------------------|---------------------|--|
|                              | 09/670,124             | CHAN ET AL.         |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Thomas Duong           | 2145                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 04 April 2005.

2a)  This action is FINAL.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-39 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-39 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
    Paper No(s)/Mail Date \_\_\_\_\_  
4)  Interview Summary (PTO-413)  
    Paper No(s)/Mail Date. \_\_\_\_\_.  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_.  
\_\_\_\_\_

## DETAILED ACTION

### ***Request for Continued Examination***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.
2. Amendment received April 4, 2005 has been entered into record. *Claims 1-39* remain pending.

### ***Response to Amendment***

3. This office action is in response to the applicants Amendment filed on April 4, 2005. Applicant amended *claims 1-2, 11-12, 21, 29-30 and 39*. *Claims 1-39* are presented for further consideration and examination.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 11, 21, and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by

Douceur et al. (US006247061B1).

6. With regard to claims 1, 11, 21, and 29, Douceur discloses,

- *retrieving a search order table specifying order for servicing of M queues, the search order table having a plurality of table entries corresponding to the M queues that selectively store the packets, the table entries storing values that specify relative positions of the M queues and that are selected based upon a transmission constraint of the communication system; and* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56)

Douceur teaches of “*a flexible packet scheduling mechanism that supports multiple scheduling algorithms ... to deliver packets from a packet flow over communications in such a manner that service quality requirements for a data stream are met*” (Douceur, col.2, lines 51-57). Specifically, Douceur teaches of a “*sequencer component [that] maintains priority lists of packet flow queues and will service the highest priority queue list followed by each successive priority list until no packets remain for transmission*” (Douceur, col.3, lines 61-65).

Furthermore, according to Douceur, “*each priority list will have a queue discipline associated therewith that will determine in what order the packets are taken off the respective flow queues*” (Douceur, col.3, line 66 – col.4, line 1). Hence, Douceur teaches of a transmission method to be used in a communication network where the transmission queues are scheduled for transmission based on

a priority list, which ultimately is ordered based on a constraint or queue discipline.

- *scheduling transmission of the packets stored in the M queues based upon the search order table.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56)

Douceur teaches of “*a flexible packet scheduling mechanism that supports multiple scheduling algorithms ... to deliver packets from a packet flow over communications in such a manner that service quality requirements for a data stream are met*” (Douceur, col.2, lines 51-57). Specifically, Douceur teaches of a “*sequencer component [that] maintains priority lists of packet flow queues and will service the highest priority queue list followed by each successive priority list until no packets remain for transmission*” (Douceur, col.3, lines 61-65).

Furthermore, according to Douceur, “*each priority list will have a queue discipline associated therewith that will determine in what order the packets are taken off the respective flow queues*” (Douceur, col.3, line 66 – col.4, line 1). Hence,

Douceur teaches of a transmission method to be used in a communication network where the transmission queues are scheduled for transmission based on a priority list, which ultimately is ordered based on a constraint or queue discipline.

#### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2-10, 12-20, 22-28, 30-33 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Douceur et al. (US006247061B1) and in view of Prieto, Jr. et al. (US006738346B1).

9. With regard to claims 2, 12, and 30, Douceur discloses,

See *claims 1, 11, and 29* rejection as detailed above.

However, Douceur does not explicitly disclose,

- *wherein the M queues corresponds to different transmission regions, and the transmission constraint in the retrieving step specifies that the packets are to be transmitted to the transmission regions that are non-interfering, the communication system being a satellite communication system.*

Prieto teaches,

- *wherein the transmission constraint in the retrieving step specifies that the packets are to be transmitted to a plurality of destination nodes that are non-interfering, the communication system being a satellite communication system.* (Prieto, col.1, line 62 – col.2, line 8; col.3, line 55 – col.4, line 65)

Prieto teaches of “*a downlink scheduler ... provided for scheduling the downlink transmission of data cells in a spot beam processing satellite. The downlink scheduler includes a beam selector for selecting one of the spot beams associated with the satellite ... and [passing] at least one data cell from a selected retail connection to a downlink modulator*” (Prieto, col.1, line 62 – col.2, line 8). Furthermore, according to Prieto, “*each queue corresponds to a different beam and thus a different geographic area to be illuminated. Each queue [also]*

*includes a buffer and a service discipline*" (Prieto, col.4, lines 39-42). Hence, Prieto teaches of a satellite communication network that has queues corresponding to different transmission beams and thus a different transmission region or area.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Prieto and the teachings of Douceur to "*provide an innovative hierarchical scheme for scheduling data cell throughput from the cell switch to the downlink modulator in a satellite system. A downlink scheduler implementing such a scheme will thus provide more efficient and fair scheduling of downlink resources, while maintaining certain Quality of Service guarantees*" (Prieto, col.1, lines 50-56). According to Prieto, "*by dynamically scheduling the beam hop based on actual user demand, subscription rates, and QoS constraints, the beam selection stage makes efficient use of bandwidth not possible with the conventional fixed tables approach*" (Prieto, col.4, lines 49-53).

10. With regard to claims 3, 13, 22 and 31, Douceur and Prieto disclose,
  - *transmitting the packets via N number of transmitters, wherein N is less than or equal to M.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)
11. With regard to claims 4-6, 14-16, 23-24 and 32-34, Douceur and Prieto disclose,
  - (a) *checking whether a particular one of the M queues has a packet stored therein and satisfies the transmission constraint;* (Douceur, col.2, line 51 – col.4,

line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)

- *(b) selectively including the particular queue in a transmission list based upon the checking step; and (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)*
- *(c) iteratively performing steps (a) and (b) until at least one of each of the M queues is checked and N number of the queues are included in the transmission list. (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)*

12. With regard to claims 7-8, 17-18, 25-26 and 35-36, Douceur and Prieto disclose,

- *wherein the search order table in the retrieving step has L consecutive table entries associated with L queues that satisfy another transmission constraint.*  
(Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)
- *wherein the transmission constraint in the retrieving step specifies that the packets are to be transmitted to a plurality of destination nodes that are non-interfering, and the other transmission constraint specifies that only one of the destination nodes selectively requires high-powered transmission.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)

13. With regard to claims 9-10, 19-20, 27-28 and 37-38, Douceur and Prieto disclose,
  - *inputting repetitive table entry values in the search order table based upon relative traffic load associated with a plurality of destination nodes.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)
  - *generating a plurality of search order tables based upon a plurality of power constraints associated with the communication system; storing the plurality of search order tables; and selecting a particular one of the plurality of search order tables.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)
14. With regard to claim 39, Douceur discloses,
  - *scheduling transmission of the packets stored in a plurality of queues based upon a search order table specifying order for non-sequential servicing of the queues corresponding respectively to a plurality of nodes, wherein the search order table has a plurality of table entries corresponding to the queues, the table entries storing values that specify relative positions of the queues according to a transmission constraint relating to the nodes; and* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56)

Douceur teaches of “*a flexible packet scheduling mechanism that supports multiple scheduling algorithms ... to deliver packets from a packet flow over communications in such a manner that service quality requirements for a data stream are met*” (Douceur, col.2, lines 51-57). Specifically, Douceur teaches of a “*sequencer component [that] maintains priority lists of packet flow queues and*

*will service the highest priority queue list followed by each successive priority list until no packets remain for transmission" (Douceur, col.3, lines 61-65).*

Furthermore, according to Douceur, *"each priority list will have a queue discipline associated therewith that will determine in what order the packets are taken off the respective flow queues" (Douceur, col.3, line 66 – col.4, line 1).* Hence, Douceur teaches of a transmission method to be used in a communication network where the transmission queues are scheduled for transmission based on a priority list, which ultimately is ordered based on a constraint or queue discipline.

However, Douceur does not explicitly disclose,

- *transmitting the packets to the nodes over one or more satellite links according to the servicing of the ordered queues.*

Prieto teaches,

- *transmitting the packets to the nodes over one or more satellite links according to the servicing of the ordered queues.* (Prieto, col.1, line 62 – col.2, line 8; col.3, line 55 – col.4, line 65)

Prieto teaches of *"a downlink scheduler ... provided for scheduling the downlink transmission of data cells in a spot beam processing satellite. The downlink scheduler includes a beam selector for selecting one of the spot beams associated with the satellite ... and [passing] at least one data cell from a selected retail connection to a downlink modulator" (Prieto, col.1, line 62 – col.2, line 8).* Furthermore, according to Prieto, *"each queue corresponds to a different beam and thus a different geographic area to be illuminated. Each queue [also] includes a buffer and a service discipline" (Prieto, col.4, lines 39-42).* Hence,

Prieto teaches of a satellite communication network that has queues corresponding to different transmission beams and thus a different transmission region or area.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Prieto and the teachings of Douceur to *"provide an innovative hierarchical scheme for scheduling data cell throughput from the cell switch to the downlink modulator in a satellite system. A downlink scheduler implementing such a scheme will thus provide more efficient and fair scheduling of downlink resources, while maintaining certain Quality of Service guarantees"* (Prieto, col.1, lines 50-56). According to Prieto, *"by dynamically scheduling the beam hop based on actual user demand, subscription rates, and QoS constraints, the beam selection stage makes efficient use of bandwidth not possible with the conventional fixed tables approach"* (Prieto, col.4, lines 49-53).

#### **Response to Arguments**

15. Applicant's arguments with respect to *claims 1, 11, 21, 29, and 39* have been considered but are moot in view of the new ground(s) of rejection.

#### **Conclusion**

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Duong whose telephone number is 571/272-3911. The examiner can normally be reached on M-F 7:30AM - 4:00PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Valencia Martin-Wallace can be reached on 571/272-6159. The fax phone numbers for the organization

where this application or proceeding is assigned are 703/872-9306 for regular communications and 703/872-9306 for After Final communications.

*Thomas Duong (AU2145)*

*July 7, 2005*



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